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# SCIENCE :

A WEEKLY RECORD OF SCIENTIFIC  
PROGRESS.

JOHN MICHELS, Editor.

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At the last meeting of the "*American Chemical Society*," Professor A. R. Leeds called attention to the reported adulteration of certain articles of food, and made special reference to the adulteration of sugar and syrups, with glucose.

The result of Dr. Leeds' examination of sugar shows, that it was of excellent quality and almost free from any adulteration, and that he was enabled, after investigations, to "contradict with equal decisiveness, the notion that table syrups are largely, almost universally, adulterated with glucose syrups."

As Dr. Leeds stated that one of the objects of his paper was to correct, what he calls, sensational reports of adulteration, and to place on record his own scientific work as evidence that adulterations to a large extent do not exist, it may be prudent to test the integrity of his work, by comparing it with results achieved by another chemist, having a high reputation as an analyst, who appears to have made investigations covering the same ground, as that instituted by Professor Leeds. We allude to Professor Harvey W. Wiley, whose paper on "Glucose and grape-sugar" appears at an opportune moment. According to Professor Wiley, the manufacture of glucose is conducted on a scale which will result in eleven million bushels of corn being used for that purpose during the present year, and as a bushel of corn will produce about 30 pounds of glucose, it would appear that over three hundred million pounds of glucose will be placed on the market during the year 1881, with every indication that the quantity will be doubled in 1882.

What becomes of all this glucose? Professor Wiley states that some of it is used for brewing beer, taking the place of malt; it is also given as a food for bees; "all soft candies, waxes and taffies, and a large proportion of stick-candies and caramels are made of glucose"; but "A VERY LARGE PROPORTION OF ALL THE GLUCOSE MADE IS USED FOR THE MANUFACTURE

OF TABLE SYRUPS." \* \* \* "When these syrups are sent into the shops, they are sold to consumers under such altisonant names as Maple Drip, Bon Ton, Upper Ten, Magnolia, Extra Choice, Golden Drip, White Loaf Drip," etc., etc. \* \* \* "Dealers tell me that these syrups, by their cheapness and excellence, have driven all others out of the market. So much is this the case that it is no longer proper to call glucose the 'coming syrup.' It is the syrup which has already come."

"Grape sugar is used chiefly for the adulteration of other sugars. When it is reduced to fine powder; it can be mixed with cane sugar in any proportion, without altering its appearance. Since the grape-sugar costs less than half the price of cane sugar, this adulteration proves immensely profitable."

We do not propose to decide upon the issue thus raised by Professors Leeds and Wiley, but as both admit to have spoken after a full investigation, it is difficult to discover how results so different were arrived at. We believe that Professor Leeds reported correctly on the samples as he found them, but if Professor Wiley is correct, the former must have been very fortunate, or, perhaps, unfortunate, in the selection of his samples.

We are in receipt of a communication, stating that glucose sugar has now an immense sale, and that in the West, nine-tenths of the syrups on the market have but 5 to 15 per cent. of cane sugar.

Possibly in first-class stores in New York City, the sugars and syrups offered for sale are genuine, but it appears folly to shut our eyes to the immense use of glucose and grape-sugar for mixing purposes.

If Professor Leeds wishes his future communications on adulteration to be read with "vivid interest," or his reports to reach what he terms, "a commanding position in the literature of adulterations," he will offer some evidence that Professor Wiley is in error, while a few facts, showing the destination of the 500 tons of glucose and grape-sugar manufactured every day, will be timely and welcome.

We find that the first cost of glucose and grape-sugar is about one cent a pound, and that it is sold direct for three to four cents a pound. The manufacture therefore of glucose is a profitable industry, and one likely to be conducted with spirit and enterprise.

Is glucose wholesome? It may be early to answer this question, as some physicians are opposed to its use, but, as an article of food, it is now generally acknowledged to be a wholesome product, and if carefully and properly made, free from any deleterious substances. We therefore fail to find any reason why this thriving industry should not be conducted openly, and the product sold on its merits, thus escaping the odium which is cast on all counterfeit substances.

THE latest number of the journal of the *Royal Microscopical Journal* is largely occupied with papers discussing the question of angular aperture; that by Mr. Frank Crisp disposes of 60 pages, and another by Professor E. Abbe occupies 30 pages.

The editor of the *American Journal of Microscopy* proposes to offer the whole of Mr. Crisp's paper in a forthcoming number; those, therefore, who are interested in the subject can read it there in its integrity; in the meantime, the résumé to be found in another part of this issue, may be found useful. We may remind our readers that this discussion has continued for the last ten years, with the prospect of a settlement of the question as remote as ever.

Probably the Counsel for Cadet Whittaker, at the recent court-martial, was not aware of the magnitude of the question when he asked Professor Piper, of Chicago, "What is Angular Aperture?" Perhaps Mr. Park Benjamin, who is said to have prompted the question, will himself answer the question.

A WRITER in "*The Journal of Science*" defends the old system of "Weights and Measures" as against the metric system. He admits that in refined scientific investigations the metric system has advantages, but he is opposed to it for purposes of daily life and retail trade. He maintains that the nomenclature and the notation of the metric system requires reorganizing, with plain, simple and short names for its various grades, to be expressed in such a manner as to banish the decimal point beyond all ordinary transactions.

It appears to us that the metric system requires little apology for its defects, when, as the writer admits, the old system is complicated, and has a total want of unity in its weights and measures. In England, a peck of potatoes, apples, etc., is 20 lbs. in Lancashire, 21 lbs. in Sheffield, 14 lbs. in Huddersfield, and 16 lbs. in Halifax. A stone of anything is in some districts 14, and in others 16 lbs. A gill in the north of England is half, but in the south only a quarter, of a pint. Almost every county has its peculiar acre, and these examples might be multiplied.

A WRITER in "*The Astronomical Register*" draws attention to an error in the "*Memoir*" of Sir William Herschell, and repeated by Professor Holden, in "*Sir William Herschell, his Life and Works*," in styling Sir William a baronet.

We find Mr. James L. McCance is correct in making the inference that Sir William Herschell was created a knight, only. His son, Sir John Frederick William, was created a baronet in 1838.

We notice that Burke's Peerage affords little information on the subject, giving no date when the great astronomer was created a knight. Professor Holden mentions the year 1816 as the date of that event.

## THE UNITY OF NATURE.

BY THE DUKE OF ARGYLL.

### VIII.

#### THE ORIGIN OF RELIGION CONSIDERED IN THE LIGHT OF THE UNITY OF NATURE.

If any one were to ask what is the origin of hunger or what is the origin of thirst, the idleness of the question would be felt at once. And yet hunger and thirst have had an origin. But that origin cannot be separated from the origin of Organic Life, and the absurdity of the question lies in this—that in asking it, the possibility of making such a separation is assumed. It involves either the supposition, that there have been living creatures which had no need of food and drink, or else the supposition, that there have been living creatures which, having that need, were nevertheless destitute of any corresponding appetite. Both of these suppositions, although not in the abstract inconceivable, are so contrary to all that we know of the laws of Nature, that practically they are rejected as impossible. There always is, and there always must be, a close correspondence between the intimations of sensibility and the necessities of Life. Hunger is the witness in sensation to the law which demands for all living things a renewal of force from the assimilation of external matter. To theorize about its origin is to theorize about the origin of that law, and consequently about the origin of embodied Life. The Darwinian formula is not applicable here. Appetite cannot have arisen out of the accidents of variation. It must have been coeval with organization, of which it is a necessary part. The same principle applies to all elementary appetites and affections, whether they be the lower appetites of the body or the higher appetites of the mind. They exist because of the existence of certain facts and of certain laws to which they stand in a relation which is natural and necessary, because it is a relation which is reasonable and fitting. Really to understand how these appetites and affections arose, it would be necessary to understand how all the corresponding facts and laws came to be. But in many cases—indeed in most cases—any such understanding is impossible, because the facts and the laws to which every appetite corresponds are in their very nature ultimate. They are laws behind which, or beyond which, we cannot get. The only true explanation of the appetite lies in the simple recognition of the adjusted relations of which it forms a part; that is to say—in a recognition of the whole system of Nature as a reasonable system, and of this particular part of it as in harmony with the rest. Any attempted explanation of it which does not start with that recognition of the reasonableness of Nature must be futile. Any explanation which not only fails in this recognition, but assumes that the origin of anything can be interpreted without it, must be not only futile but erroneous.

Men have been very busy of late in speculating on the origin of Religion. In asking this question they generally make, often as it seems unconsciously, one or other of two assumptions. One is the assumption that there is no God, and that it must have taken a long time to invent Him. The other is that there is a God, but that men were born, or created, or developed, without any sense or feeling of His existence, and that the acquisition of such a sense must of necessity have been the work of time.

I do not now say that either of these assumptions is in itself inconceivable, any more than the supposition that at some former time there were creatures needing food and drink and yet having no appetites to inform them of the fact. But what I desire to point out is, first, that one or other of these assumptions is necessarily involved in most speculations on the subject, and secondly, that, to say the least, it is possible that neither of these assumptions may be true. Yet the method of inquiry to be pursued re-